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TITLE OF THE RESEARCH PAPER: To what extent do gas take-or-pay contracts facilitate the development of infant gas markets and how do they challenge not only the mature liberal markets of North America but also the European markets which are a recent subject of liberalisation concerning the production, transmission, distribution, supply and metering of natural gas?

ABSTRACT OF THE PAPER:

This research paper examines the functions of long-term take-or-pay obligations of gas sales agreements in North America and Europe. It analyses that either growing market maturity, deregulation or liberalisation turn their initial mutual proportionality into a growing risk for both contractual parties. Finally, it concludes with modern tools of financial risk management whose diligent usage will cover all the initial objectives of take-or-pay commitments.

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STATEMENT OF ORIGINALITY

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Research Paper

To what extent do gas take-or-pay contracts facilitate the development of infant gas markets and how do they challenge not only the mature liberal markets of North America but also the European markets which are a recent subject of liberalisation concerning the production, transmission, distribution, supply and metering of natural gas?

by

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LL.M. Programme

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Abbreviations

ACQ	Annual Contract Quantity
CCGT	Combined Cycle Gas Turbine
EC	European Communities
EU	European Union
FERC	Federal Energy Regulatory Commission
FPC	Federal Power Commission
LDC	Local Distribution Company
LNG	Liquefied Natural Gas
OTC	Over-The-Counter
PEC	Primary Energy Consumption
PSO	Public Service Obligation
TOP	Take-or-pay
TPA	Third Party Access

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1. Introduction

This paper will discuss take-or-pay [TOP] obligations as an essential part of the non price-determined terms of common gas sales agreements by questioning both the legal and the economic logic underlying these terms. It analyses to what extent these provisions facilitate the development of infant gas markets but takes also mature ones into account. Consequently, it asks whether the merits of long-term TOP contracts will outweigh their risks if the economical or regulatory framework of gas markets changes towards deregulation. This approach is justifiable by the difficulties that occurred in the North American gas markets of the 1980s but also by the risks which European marketers face as a result of the recent liberalisation of the European gas markets. After a having given a brief account of the gas industry structure, the categories and key-provisions of gas sales agreements are described. The next part examines the economic rationale of TOP terms on infant markets before their impact on North American mature markets is discussed. Subsequently, the TOP problem on European markets is addressed stressing different stages of market development and its the impact on European legislation. Finally, it will be concluded that the relevance of TOP obligations is utterly declining and that the future of financial risk management belongs not only to flexible short term sales agreements but also to spot and future markets.

2. Background

Before focusing on the key-provisions of gas sales agreements, the basic economic principles of the gas industry will be reported.

2.1 Structure of the Gas Industry

In contrast to other energy related commodities which are subject of a single world market[1], the gas industry is divided into three regional gas markets[2]. A world gas market is not likely to develop because of distance related, extraordinary transportation costs. These depend on the nature of gas as a generally network bound commodity[3]. Therefore, the successful development of infant gas markets demands a long, firm and fixed supply chain connecting the wellhead and processing plant of the producers, the transmission networks of the pipeline operators, the distribution networks of the Local Distribution Companies [LDC] and the final consumers[4]. Fixation is a result of the expensive physical links within the chain. As the whole network is easily affected by disruptions - either downstream in terms of supply or upstream in terms of cashflows - firm and long-term relationships are likely to occur. The infrastructure is also responsible for large capital investments which even exceed the high expenditure of the oil industry by four to ten times[5] for a number of reasons: Primarily, gas pipelines depend on the economies of scale[6].

[1] e.g. crude oil, coal.
[2] located in North America, Europe and Asia/Pacific.
[3] apart from the exemption of liquefied natural gas [LNG].
[4] World Bank Energy Department, ESMAP, Long-Term Gas Contracts, Report No. 152/93, p 9.
[5] J.-M. Chevalier, The Development of Competition in European Gas Markets, p.6.
[6] J.-M. Chevalier, The Development of Competition in European Gas Markets, p.6.

Secondly, they have to be larger than comparable oil pipelines[7]. Thirdly, expensive storage facilities are required.

Financing these investments involve banks which will intensively look for securities. In order to cope with the risks of exploration, marketing, price and with the infrastructure expenditure, investors seek long term relationships with reliable sellers. The latter themselves were keen to agreeing on long-term agreements as either the duration of the contract was a means of competition instead of the regulated prices (United States) or they were backed up by large legal or factual monopolies on domestic markets (Europe) rather focusing on the security than the costs of supply[8]. This situation changes if the industry is deregulated as even imperfect competition is superior to regulation of a monopoly[9].

2.2 Categories of Gas Sales Agreements

Traditional gas sales agreements fall into four different categories. Firstly, one can distinguish depletion contracts which dedicate the whole capacity of small or medium fields to a specific vendee[10] and supply contracts which are not related to the output of a specific field. These are suitable for vendors owning large fields or groups of fields. Thirdly, seller's option contracts allow the vendor to nominate the delivered amount and are chosen if the gas is a by-product of associated oil resources whereas buyer's option contracts grant the vendee the right to decide

[7] The calorific value of a specific volume of oil exceeds the value of natural gas so that larger pipelines are required in order to transport similar energy capacities.
[8] infra at 4.1.
[9] E.J. Mestmäcker, *Energy Policy for Natural Gas in the Internal Market - An overview*, pp 1-17, p 7, in E.J. Mestmäcker (ed.), Natural Gas in the Internal Market, A Review of Energy Policy (1st ed.)(London, UK, Graham & Trotman Ltd, 1993).
[10] N. Trimble, *An Introduction to Gas Sales Agreements*, O.G.L.T.R. 331 (1992) p 331.

about the quantity within the agreed amounts[11]. Notwithstanding this differences, gas sales agreements share numerous key-terms.

2.3 Non Price Determined Provisions of Traditional Gas Sales Agreements

Apart from the basic agreement of sale and purchase, the non price determined provisions of gas sales agreements focus on the quantities, take-or-pay and the duration.

2.3.1 Contract Quantities

The contractual quantity which the buyer may nominate in advance is laid down by a series of terms. The daily contract quantity [DCQ] represents the daily average of the annual contract quantity [ACQ]. Due to seasonal fluctuations in demand the term of delivery capacity is introduced which denotes the maximum daily amount which the vendor is obliged to deliver. The latter term exceeds the DCQ. In order to avoid in-economic small scale deliveries the terms of minimum nomination and zero nomination are introduced. The term excess gas describes nominated volumes beyond the daily capacity which are not subject of a stringent seller's obligation.

2.3.2 TOP

The basic idea of TOP provisions is that the buyer is obliged to pay the contract quantity of gas even if he fails to take delivery in order to guarantee a cashflow for the seller[12]. One could argue that the legal rationale of TOP is an alternative

[11] This paper will concentrate on the seller's option contracts as associated resources are irrelevant for North American and European gas markets. Notwithstanding this differences, gas sales agreements share numerous key terms.

[12] N. Trimble, *An Introduction to Gas Sales Agreements*, O.G.L.T.R. 331 (1992) p 333; E.E. Smith, Current Natural Gas Contract Issues in the United States Take-Or-Pay Disputes, p 3 and 6.

obligation of the buyer[13] so that he should be always free to choose between delivery or sole payment. The distinction between primary/secondary obligations and alternative obligations depends on the intention of the parties[14]. As the pure buyer's payment without taking delivery is generally not regarded as to have any commercial value reasonable vendees, it is more persuasive to argue, that this obligation is a secondary obligation in the terms of liquidated damages[15]. These contractually defined damages favour the seller to the largest extent as he is normally obliged to reduce the claim by the amount which is saved due to the non fulfilment of the delivery of the commodity or due to the revenue earned by alternative sales. Furthermore, the legal feasibility of TOP was challenged by the argument that it should be regarded as punitive damages which are not sustained by common law[16]. In order to weaken this argument various additional terms have been introduced in order to make the clause more flexible. First of all, the TOP obligation only refers to a specific percentage of the ACQ[17]. Secondly, the buyer may make up gas volumes not taken but already paid in one year in order to get free volumes in the following years after having taken delivery of the ACQ. Thirdly, the buyer may have a carry forward right which allows him to use past gas deliveries exceeding the ACQ as a means to reduce his TOP obligations of following years[18].

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[13] q.v. G.B. Greenwald, *Natural Gas Contracts under Stress: Price, Quantity and Take or Pay*, 1 JERL 1 (1987) p 2.
[14] Corbin, A.L. Corbin on Contracts: a comprehensive treatise on the working rules of law, 8th ed. 1993, § 1070.
[15] This question may be important if the buyer decides to pay without delivery in order to threaten the seller who has to deliver in order to exploit associated resources and to achieve renegotiations; q.v. B.Phillips, *Examining the future of Long-term Take or Pay contracts*, O.G.L.T.R. 73 (1997) p 73.
[16] G.B. Greenwald, *Natural Gas Contracts under Stress: Price, Quantity and Take or Pay*, 1 JERL 1 (1987) p2. This is also true for civil law.
[17] E.E. Smith, Current Natural Gas Contract Issues in the United States Take-Or-Pay Disputes, p4; in European TOP contracts typically 70-100%.
[18] B.Phillips, *Examining the future of Long-term Take or Pay contracts*, O.G.L.T.R. 73 (1997) p78.

2.3.3 Contract Length

The traditional duration of gas sales agreements concentrates on the period which is required to amortise the producer's original capital investment[19]. Therefore, the parties usually chose 10 to 20 years[20]. U.S. Legislation even demanded a minimum duration of 15 years[21].

2.4 Price Determined Provisions

The terminology how to define the price determined provisions of gas sales agreement is not consistent[22]. However, it seems to be most appropriate to define fixed prices either as constant prices for the whole duration or as prices bound to escalating formulas depending on constant factors[23]. Contrarily, market based prices should be understood as prices linked to escalator-formulas which depend on the development of unforeseeable market based indexes[24] and commodity prices[25]. These formulae can be used more flexible if several commodities are combined or separate formulas are compared in order to choose the lower price [Top-stop] or the higher price [bottom-stop][26].

[19] i.e. Field development and transportation infrastructure.
[20] R.-J. Sutherland, Natural gas contracts in an emerging competitive market, Energy Policy 1191 (1993) p 1196.
[21] Natural Gas Act of 1938, ch. 556, 52 Stat. 821 (193) codified at 15 U.S.C. §§ 717-717w (1988).
[22] R.-J. Sutherland, Natural gas contracts in an emerging competitive market, Energy Policy 1191 (1993) p 1197.
[23] e.g. prices which rise by a fix percentage every year.
[24] e.g. British producer price index.
[25] spot prices for crude oil, oil product prices, spot electricity prices, coal
[26] N. Trimble, *An Introduction to Gas Sales Agreements*, O.G.L.T.R. 331 (1992) p 336.

3. Rationale of Long-term TOP Obligations in the Early Stages of Market Development

There is nearly unanimous consent that long-term gas sales TOP agreements play a crucial role concerning the development of gas markets[27]. TOP obligations became a standard clause in the 1950s[28]. This development is justified by various arguments: The terms successfully cope with the seller's demand risk for the lifetime of the project[29]. Thereby, it also reduces the effect of cross-fuel competition. As gas is a highly substitutable commodity[30], this finding has outstanding relevance. By eliminating demand risk these clauses provide secure long-term cash flows, too[31]. These cashflows can be used to calculate the process of the amortisation of the equipment precisely in a very early stage. Furthermore, long-term contractually fixed cashflows are a useful means of project finance as banks want to secure their loans. Additionally, the buyer - backed by transmission, distribution and supply monopolies - is regarded as an extremely reliable debtor. Although a long-term contract may be initially expensive because of 12- to 18-months of legal negotiations[32], it generally minimises expenditure as frequent re-negotiations are avoided. Another economic argument for long-term legal relations is based on the fact that the supply chain provides for a highly mutual dedication of the physical linked investments[33]. This argument is backed by the fact that most gas resources are

[27] N. Trimble, *An Introduction to Gas Sales Agreements*, O.G.L.T.R. 331 (1992) p 333; J.-M. Chevalier, The Development of Competition in European Gas Markets, p.30.
[28] E.E. Smith, Current Natural Gas Contract Issues in the United States Take-Or-Pay Disputes, p1.
[29] E.E. Smith, Current Natural Gas Contract Issues in the United States Take-Or-Pay Disputes, p6; q.v. contracts for the "life f the well"
[30] J.-M. Chevalier, *The Development of Competition in European Gas Markets*, p.6.
[31] G.B. Greenwald, *Natural Gas Contracts under Stress: Price, Quantity and Take or Pay*, 1 JERL (1987) p1.
[32] M. Groom, *The problems of Short-term Gas Contracts*, O.G.L.T.R. 101 (1993) p 102.
[33] R.-J. Sutherland, *Natural gas contracts in an emerging competitive market*, Energy Policy 1191 (1993) p 1198.

located far away from the retail markets. Contrarily, the traditional buyer takes advantage of these provisions by concentrating on the reliability of long-term supply rather than by looking for the cheapest means of supply. This approach is economically justified as long he is bound to supply his consumers on the basis of a regulated, cost oriented tariff[34] so that he is able to recover his additional expenditure. Additionally, the so categorised buyer is able to predict the demand of his supply area sufficiently accurate in order to adjust the TOP obligation properly in the long run[35]. This would be nearly impossible in competitive environments.

A second opinion points out that this traditional doctrine of long-term TOP obligations is no longer true, if a new field is developed which shall supply a mature liberal gas market[36]: It may be developed on the basis of a mixture of short term agreements[37] as it is not feasible that the competing marketers return to long-term obligations only to serve the interests of one capital investor.

It remains an interesting question whether this idea could be extended to the thesis that even new gas fields in infant gas markets could be developed relying on a mixture of short term contracts. The answer shall be positive if the initial market framework is liberal provided that there is a third party access [TPA] to the new networks for a large numbers of buyers and sellers as one can argue that there is an economical analogy between the former idea and the latter thesis[38].

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[34] e.g. U.S. before deregulation, France.
[35] S.Hampshire and S.A. Wardlaw, *The E.U. Gas Liberalisation Directive-Facing the Future*, O.G.L.T.R. 295 (1998) 297.
[36] G.B. Greenwald, *Natural Gas Contracts under Stress: Price, Quantity and Take or Pay*, 1 JERL (1987) p12.
[37] e.g. a mixture of short-term TOP contracts (1-3 years), spot market sales and futures.
[38] q.v. T.W. Wälde, Liberalisation of EC Gas Transportation. A critical Review of Legal and Policy Arguments Driving the Discussion on Third Party Access, p 10-11: It is pointed out that TPA does not prevent network operators from building new pipelines.

4. Impact of TOP Provisions on The Mature North American Market

The impact of TOP provisions lead to a crisis of the whole gas industry in the 1980s. As a result, the marketers avoided TOP obligations and turned to short term contracts, spot and future markets.

4.1 Situation in the U.S. between 1938 and the End of the 1970s

The U.S. gas industry was originally regulated by the Natural Gas Act of 1938[39]. This legislation is based on a report of the Federal Trade Commission which applied the concept of natural monopoly to the gas sector[40]. The regulation basically intended on reliable supply at reasonable prices. The Federal Power Commission[41] [FPC] allowed the bundling of the companies' services[42]. The companies had little incentives to work invest efficiently as the prices were subject to an approved tariff as a sum of costs added by a reasonable rate of return[43]. Additionally, the market was distorted by regulations of the producer prices by the FPC[44]. A complex interstate pricing system was introduced which differentiated between expensive gas from newly developed and cheap gas from old fields[45]. As a result producers focused on the unregulated intrastate trade with higher prices for gas from old fields. Thereby, the supply for the artificially cheap intrastate trade diminished while the interstate demand increased. During the 1970s, this interstate market was characterised by long-term TOP gas sales agreements. Apart from the already stated advantages of

[39] Natural Gas Act of 1938, ch. 556, 52 Stat. 821 (193) codified at 15 U.S.C. §§ 717-717w (1988).
[40] Report of the Federal Trade Commission to the U.S. Senate, S. DOC. NO. 92, 70th Cong., 1st Sess. 588-91 (1938).
[41] Predecessor of the Federal Energy Regulatory Commission.
[42] The pipeline companies bought the gas at the wellhead, transported it through their own networks to the consumers and sold it. The consumers paid a combined fee.
[43] P. Heeg, *Gas Transportation in the United States-What's to be Learned?*, O.G.L.T.R. 381 (1997) p 382.
[44] Pricing system introduced by Statement of General Policy, No. 81-1, 24 F.P.C 818 (1960).

these terms several specific hypotheses of the marketers were responsible for achieving even greater importance: Firstly, the pipeline companies thought that the gas prices would constantly raise as a result of both the above mentioned artificial low pricing policy and the oil price shock so that long-term contracts with fixed prices were regarded as proportional tools. Secondly, an increase of gas demand was predicted[46]. Thirdly, the tariffs of the pipelines were regulated by the Federal Energy Regulatory Commission [FERC] so that the pipeline company used the duration of the contracts as a means of competition when they negotiated with investors who developed new fields[47].

4.2 Altered Market Conditions in the 1980s

The existing network of long-term TOP sales agreement collapsed in the 1980s for various reasons. Firstly, the market participants had overestimated the future demand during the 1970s. Consequently, they had not only negotiated too large ACQ and dangerous TOP percentages[48] but had also used pricing formulae leading to high payments in the interstate trade[49]. The latter were a result of the demand surplus estimation based on wrong predictions following the oil price shocks. In fact, the demand for gas dramatically declined by 21% in the period between 1979 and 1987[50] causing a long-term gas surplus. Additionally, due to the false forecasts of the

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[45] The FPC had no authority regarding intrastate prices.
[46] J.S. Lowe, *Gas Contracting in the United States: Hard Times and New Responses*, O.G.L.T.R. 37 (1988/89) p 37.
[47] J.S. Lowe, *Gas Contracting in the United States: Hard Times and New Responses*, O.G.L.T.R.37 (1988/89) p38.
[48] G.J. Pegg and M.R. Walker, *Take or Pay Provisions in Natural Gas Contracts. The US Experience as a Comparator to the UK Gas Industry's Problems*, 4 JERL 456 (1996) p 458; The common percentage rate even reached 90% of the ACQ late in the 1970s; q.v. J.S. Lowe, *Gas Contracting in the United States: Hard Times and New Responses*, O.G.L.T.R. 37 (1988/89) p 39.
[49] P. Heeg, *Gas Transportation in the United States-What's to be Learned?*, O.G.L.T.R. 381 (1997) p 385.
[50] Arthur Anderson, Natural Gas Trends 1988-89.

past, several new gas fields had been developed. The beginning era of energy conservation, a series of warm winters[51], structural change[52], industries with switching fuel capabilities, declining prices of competing fuel oil and the 1982 trough in the business cycle completed the adverse situation[53]. Moreover, legislation had an impact on this "death spiral" as the construction of new gas fuelled power stations was prohibited[54]. Additionally the system of regulated price system was terminated and unbundling of the pipeline companies' activities was facilitated[55]. The policy of the FERC made the situation of the pipeline companies even worse as the minimum bills charged by the pipeline customers were prohibited[56], while FERC Order 436[57] granted 3rd party network access to producers and customers so that the pipelines role gradually changed from traders to common carriage. Taking advantage from the supply surplus, this access boosted the development of short-term, spot and future contracts and the price level dropped again. The pipeline companies faced severe financial difficulties as a result of the TOP provisions as they were no longer able to take delivery of the contract quantities and sell them profitably.

4.3 Legal Excuses of the Pipeline Companies against TOP Obligations

In order to avoid insolvency, the pipeline companies used dubious public legal excuses that either the FERC should disapprove the TOP terms in order to deny the

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[51] P. Heeg, *Gas Transportation in the United States-What's to be Learned?*, O.G.L.T.R. 381 (1997) p 384.
[52] e.g. declining steel production in the United States between 1979-1987 by 34%.
[53] J.S. Lowe, *Gas Contracting in the United States: Hard Times and New Responses*, O.G.L.T.R. 37 (1988/89) p 37.
[54] Power Plant and Industrial Fuel Use Act of 1978.
[55] Natural Gas Policy Act of 1978 which provided deregulation by 1985. Section 311 allows the FERC to approve transportation agreements.
[56] FERC Order 380, Elimination of Variable Costs from Certain Natural Gas Pipeline Minimum Commodity Bill Provisions, 49 Fed. Reg. 22,778, 22, 781-83 (November 1, 1984).
[57] FERC Order 436, Regulation of Natural Gas Pipelines after Partial Wellhead decontrol, 50 Fed. Reg. 42,408, 42,420-21 (October 9, 1985).

courts' jurisdictions or that the terms are invalid because they contravene the national energy conservation policy[58]. Secondly, contractual law doctrines were used to excuse the non fulfilment of TOP obligations[59]. It was argued that the altered market environment should be an example of force majeure, i.e. extraordinary circumstances beyond the parties' control prevent the performance. Although the parties generally theoretically have the power to specify this doctrine by the careful wording of the contract, the courts generally argued narrowly and fluctuations on commodity markets were not accepted[60]. Secondly, the commercial impracticability doctrine was used to excuse the buyer.[61] However, it is obvious that market fluctuations could never be a factor whose non-reality the parties implied on drafting the contract because the TOP obligation is expressively combined with price formulas which shall balance fluctuations. The same idea affect the defence under the frustration of purpose doctrine. The excuse under the impossibility doctrine is difficult analyse as some courts exceed it beyond physical incapacity and include events which make the transaction unreasonable under economic terms[62].

[58] Golsen v. ONG Western, Inc, 756 P.2d 1214 (Okla. 1988); E.E. Smith, Current Natural Gas Contract Issues in the United States Take-Or-Pay Disputes, p13 and 18.
[59] After the FERC had refused jurisdiction, the courts of the states were involved; q.v. G.J. Pegg and M.R. Walker, *Take or Pay Provisions in Natural Gas Contracts. The US Experience as a Comparator to the UK Gas Industry's Problems*, 4 JERL 456 (1996) p 461.
[60] q.v. Mainline Investment Corp. v. Gaines, 407 F.Supp. 423, 427 (N.D.Tex.1976) regarding oil price increases.
[61] G.B. Greenwald, *Natural Gas Contracts under Stress: Price, Quantity and Take or Pay*, 1 JERL 1 (1987) p 6.
[62] 23 N.Y. 2d 275, 296 N.Y.S. 2d 338, 244 N.E. 2d 37,41 (N.Y.Ct.Ap. 1981).

In general, it can be argued that the buyers under TOP obligations are not excused if TPA is granted to the networks and the market prices drop significantly.

4.4 FERC Order 500

The FERC Order 500[63] tried to alleviate the obligations of the pipeline companies by granting TOP credits to them if they granted TPA to their creditors. This measure is regarded as insufficient[64].

4.5. Renegotiations

Avoiding litigations, many parties settled their contracts in the next years. This is a result of the mutual interdependence expressed by the nature of gas as a network bound commodity which optimised the network operators' bargaining powers[65]. In order to create a more flexible era of contracts, the ACQ percentage rate, which defined of the TOP obligation, was decreased or totally dropped. Secondly, the price formulae were amended to allow greater flexibility. Finally, make up rights were improved so that unused volumes could be nominated in an additional period of one year after the contract was terminated. Payments regarding outstanding make up volumes after this additional period were refunded[66]. However, the buyer still suffered as the time-value of money was lost[67].

[63] FERC Order No. 500, Regulation of Natural Gas Pipeline after partial Wellhead Decontrol, FERC Stats. & Regs. (September 15, 1987).
[64] J.S. Lowe, *Gas Contracting in the United States: Hard Times and New Responses*, O.G.L.T.R. 1988/89 pp. 37-41 p39.
[65] E.E. Smith, Current Natural Gas Contract Issues in the United States Take-Or-Pay Disputes, p39.
[66] G.B. Greenwald, *Natural Gas Contracts under Stress: Price, Quantity and Take or Pay*, 1 JERL 1 (1987) p 9.
[67] E.E. Smith, Current Natural Gas Contract Issues in the United States Take-Or-Pay Disputes, p9.

4.6. Emerging Short-term Contracts, Spot Markets and Future Markets

The TPA granted to producers and LDC created a sufficient number of market participants which is needed to create spot and future markets for gas. The present gas market is dominated by spot, future trading and short-term gas sales agreements.

4.7 Market Developments in Canada

As a result of similar deregulation, the pipeline companies on the Canadian market faced a comparable problem of huge TOP obligations. Contrarily to the U.S., these debts were covered by an additional surcharge levied on the traders demanding TPA to their networks[68].

5. Impact of TOP Obligations on the European Gas Markets

The analysis of the influence of TOP contract on European gas markets has to consider that the countries are situated in different stages of market maturity and liberalisation.

5.1 Stages of Market Development

Four different stages of domestic gas market development may be classified by the criteria of percentage share of large consumers, cross-fuel competition, interdependence between producers and network operators and, lastly, the relevance of long-term TOP contracts. Infant gas markets focus on the depletion of few fields, large percentage shares of industrial consumers[69], a large impact of cross-fuel competition, a high interdependence of few producers and one or few domestic

[68] J.S. Huggins, *Take or Pay Gas Contracts: Is disaster looming?*, O.G.L.T.R. 99 (1996) p 103.
[69] These industrial consumers and electricity generators take a stable delivery and reduce the difficult peak management.

network operators, which are bound by long-term TOP contracts - including high TOP percentages - in order to amortise their initial investments for field development and transportation[70]. Sweden represents this stage[71]. The second stage (childhood) is characterised by the fact that large numbers of small consumers begin to outweigh the importance of large consumers and Spain, Finland and Turkey fall into this category[72]. The third/fourth stages of adolescence and maturity are described that gas balancing becomes more important and large interruptible users are supplied in order to avoid storage[73]. Additionally, networks interconnectors are introduced. In the middle of the 1990s, Austria, Belgium, France, Germany and the Netherlands are in this stage[74]. Elements of the maturity are amendments of the legal framework in order to liberalise the market by unbundling of the vertically integrated utilities and allowing TPA to the networks, emerging of spot and future markets and declining relevance of TOP contracts. The U.K. represents this stage since the beginning of beach trades in the 1990s. The key element of transition between the third and fourth stage is that the concept of the natural monopoly is no longer applied for the whole supply chain. If it is reduced to the network operation the general domestic competition law is applicable.

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[70] J. Estrada and A. Moe and K.D. Martinsen, The Development of European Gas Markets, 19-20 (1st ed. 1995).
[71] J. Estrada and A. Moe and K.D. Martinsen, The Development of European Gas Markets, 47 (1st ed. 1995).
[72] J. Estrada and A. Moe and K.D. Martinsen, The Development of European Gas Markets, 47 (1st ed. 1995); M. Quinlan, *Gas blossoms under the Iberian Sun*, Petroleum Economist 19 (February 1999) p 11.
[73] J. Estrada and A. Moe and K.D. Martinsen, The Development of European Gas Markets, 24 (1st ed. 1995).
[74] J. Estrada and A. Moe and K.D. Martinsen, The Development of European Gas Markets, 47 (1st ed. 1995); q.v. Germany: V.Baum, *Praise for the country's energy sector is hard-earned*, Petroleum Economist 11 (January 1999) p 14-15.

5.2 A Gas Bubble on the Mature U.K. Market

The privatisation of British Gas Corporation in 1986[75] marks the beginning of legal and regulatory amendments which lead to a fully liberalised, unbundled gas market by the end of the 1998[76]. Following the mentioned benefits of TOP provisions in regulated stages of market development[77], British Gas had accepted remarkable TOP obligations[78]. When the process of liberalisation accelerated in 1991, its market share declined so that a series of gas surpluses began in 1994. The so called "Gas Bubble" lead to declining spot market prices and is predicted to last till 2002: its total surplus is estimated as 12 billion British thermal units accounting for TOP payments of £2,4 billion[79]. Three other factors made the situation worse as several Combined Cycle Gas Turbines [CCGT] were finished late. Secondly, a series of mild winters occurred. Furthermore, the British contracts rarely used re-negotiation clauses[80].

In order to address this problem the successors of British Gas have several options. They may simply honour the obligations facing severe difficulties. They may partly apply more or less weak legal remedies as attempted by the U.S. pipeline companies[81]. British Gas was already privatised so it is hardly feasible to select the

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[75] Gas Act 1986; The Oil and Gas Enterprise Act of 1982 already granted third party access but that regulation was not effective in practical terms.

[76] The liberalisation was accompanied by inquiries of the Merger and Monopoly Commission in 1988, 1992 and 1993, by undertakings of the Director of the office of Fair Trade under the Fair trade Act 1973 and by actions of the Secretary of State. Finally, the Gas Act of 1995 introduced a new licensing system and full competition concerning residential consumers expanding the supply areas in three stages 1996, 1997 and 1998, q.v. J.P. Stern, Competition and Liberalization in European Gas Markets, 120 (1st ed. 1998) and P. Griffin and J. Zerk, *Gas Competition in the U.K.: Unbundling of Transportation and Storage*, O.G.L.T.R. 295 (1997) p 296. After complaints, a Network Code was negotiated which regulates the third party access. British Gas is de-merged into BG plc (upstream oil and gas, affiliate Transco acts as the network operator) and Centrica (trading), q.v. D. Pickering, *Transmission Pricing for Gas in a Liberalised European Gas Market-The British Experience*, O.G.L.T.R. 425 (1998) p 425.

[77] supra at 3.

[78] J.S. Huggins, *Take or Pay Gas Contracts: Is Disaster Looming?*, O.G.L.T.R. 99 (1996), p99.

[79] J.S. Huggins, *Take or Pay Gas Contracts: Is Disaster Looming?*, O.G.L.T.R. 99 (1996), p99.

[80] M. Groom, The problems of Short-term Gas Contracts, O.G.L.T.R. 1993, pp. 101-103, p 101.

[81] supra at 4.3.

Australian solution, forcing the new marketers to participate in some of the monopolist's TOP obligations as a pre-condition of privatisation[82]. Another variant is the Canadian solution charging an additional levy for TPA which is considered by government officials[83]. An elegant approach could by the export of gas to continental Europe through the new interconnector[84] but this not only depends on the development of European short term sales contracts and spot markets but also on the behaviour of competing importers[85]. Even TOP holidays are suggested[86]. So, the most likely solution seems to be a combination of several means: Entering informal re-negotiations abolishing TOP obligations or introducing TOP holidays - despite the absence of re-opener clauses -, excusing a non-fulfilment in case of detailed contractual definitions of force majeure including regulatory amendments, exporting surpluses. If the remaining problem is still likely to cause insolvency the Canadian levy solution should be considered although it is difficult to address as even private competitors entered TOP obligations in the past.

5.3 Internal Gas Market Directive and TOP Related Derogations

Before evaluating the Internal Gas Market Directive[87] [IGMD] of the European Communities [EC], which will be implemented soon, it is worth while to underline that the domestic energy policy of the member states - and that includes the treatment of TOP obligations - is recently affected by a far more stringent application

[82] J.S. Huggins, *Take or Pay Gas Contracts: Is Disaster Looming?*, O.G.L.T.R. 99 (1996) p102.
[83] supra at 4.7.
[84] S.Broadley, Written Evidence of Centrica on Draft Directive on Rules for the Internal Market in Natural Gas, O.G.L.T.R. 6 (1998) p 7. Centrica exports 8 bcm to Dutch Elsta and 3 bcm to German Thyssengas.
[85] Gazprom from Russia, Sonatrach from Algeria and Statoil/Norsk Hydro from Norway.
[86] B. Phillips, *Examining the Future of Long-Term Take or Pay Contracts*, O.G.L.T.R. 73 (1997) p 77.
[87] Directive 98/30/EC of the European Parliament and of the Council of 22 June 1998 concerning common rules for the internal market in natural gas, OJ L 204, 21.7.98.

of the general rules of the Treaty of Rome as amended in 1997 [ECT1997][88]. Paragraph 30 of the IGMD-preamble[89] stresses the conflicting goals of both derogations from TPA due to serious difficulties to meet TOP obligations and avoiding long term market distortions. It points out that liberalisation shall prevail.

The IGMD itself obliges the Member States to grant non discriminatory, transparent, negotiated or regulated TPA to the networks to producers and eligible consumers[90]. This access may be challenged for various reasons: Lack of capacity[91]; non fulfilment of public service obligations [PSO][92]; severe economic and financial difficulties to meet TOP obligations[93]; reciprocity[94]; safeguards[95]. The application of a TOP related derogation is based on the fulfilment of additional criteria[96]: A gas undertaking[97] facing TOP difficulties is required to apply for a derogation. The involved authorities[98] have to consider a catalogue of objectives[99]. While four criteria refer to

[88] Treaty Establishing the European Economic Community, March 25, 1957 (entered into force January 1, 1958); as amended by the Treaty on European Union, as amended by the Treaty of Amsterdam Amending The Treaty on European Union, The Treaties Establishing the European Communities and Certain Related Acts, Oct 2, 1997, Official Journal of the European Communities 97/C/430/01 (entered into force May 1, 1999). e.g. internal market for goods Art. 23, for labour Art. 39, 43, for services Art. 49, for capital Art. 56, competition policy Art. 81-86; Trans-European-Networks Art.154.

[89] Paragraph 30 of the preamble of the IGMD

[90] Negotiated TPA under Art.15, regulated TPA under Art.17. Art. 18: It provides that gas power stations and consumer above a threshold are eligible consumers. Additional groups have to includes unless a minimum access of 20% of the consumers is achieved. In two stages both the thresholds are lowered and the minimum opening is raised.

[91] Art.17(1)1st variant; nota bene: Art. 17 (2) obliges to introduce incentives in order to expand the network.

[92] Art.17(1)2nd variant and Art.3(2) IGMD.

[93] Art.17(1)3rd variant IGMD.

[94] Art.19(1)(b). A Member State may refuse TPA if a foreign company tries to import energy to an eligible consumer whereas domestic competitors are not able to supply this kind of consumers on the exporter's market due to slower liberalisation (Free-rider-problem).

[95] Art.24(1-3) IGMD.

[96] These are laid down in Art.25 (1-3) IGMD.

[97] Art. 2 (1). Art. 25 (1) is remarkable as directives usually not focus on the behaviour of private entities.

[98] i.e. regional authorities, the Member States or the Commission.

[99] Art. 25 (3); q.v. J.Candon, *Recent Development in the Proposed E.U. Gas Directive: Consolidated Text of the Political Agreement Reached at the Energy Council Meeting*, O.G.L.T.R. 286 (1998) p 287-288.

public interests [100], five concentrate on the extent to which it is worthwhile to protect the company: its competitiveness[101], the intensity of its difficulties[102], the flexibility of the TOP obligations[103], the intensity of attempts to re-negotiate[104], the probability of market liberalisation during the contract drafting[105]. As the wording of these terms is quite vague, their interpretation has to be clarified by the authorities and judicial review. One might reduce the value of TPA by protecting entities which carry out TOP obligations backed by the argument that the IGMD argues for a narrow TPA as it does not define LDC as eligible for TPA in Art.18 although they have a remarkable market share[106]. However, it seems to be more accurate to argue in favour of liberalisation rather than to protect former monopolistic entities. This is backed by the legal principle of narrow interpretation of exceptional provisions. Additionally, the teleology of European Law in-doubtfully demands the rapid creation of a single market rather long-term distorted markets. Finally, this result is consistent with macroeconomic terms and with the fact that the minimum market opening of the IGMD is already voluntarily exceeded by many Member States[107]. Finally, an EC Gas Bubble caused by TOP is less probable as the EC Resources will rapidly decline in the near future while the demand will rise significantly due to the installation of

[100] liberalisation Art. 25 (3) lit (a)(i); PSO Art. 25 (3) lit (b); interconnection Art. 25 (3) lit (h).
[101] Art. 25 (3) lit (c) IGMD.
[102] Art. 25 (3) lit (d) IGMD.
[103] Art. 25 (3) lit (e) IGMD.
[104] Art. 25 (3) lit (f) IGMD.
[105] Art. 25 (3) lit (g) IGMD.
[106] q.v. F. Thackeray, *European Union: The Gas Directive is only half the story*, Petroleum Economist, 32 (May 1999) p32: e.g. LDC account for 46% in Belgium, 70% in France and 68% in Germany.
[107] q.v. Complete opening in Germany by the Energy Industry Act of April 1998; q.v. H. Avati, *Market opening gathers pace*, Petroleum Economist 31 (April 1999) p 31: initial market opening in Spain 46%, in The Netherlands 47%.

highly energy efficient CCGT[108]. The teleology of the Energy Charter Treaty also provides an incentive for a narrow interpretation of TPA excuses[109].

6. Conclusion

This paper has discussed the rationale of long-term TOP provisions in the North American and European gas sectors and revealed its limited value if the regulatory framework is liberalised. The result is that flexible short-term Non-TOP gas contracts should prevail which reflect that gas has to be sold in markets affected by both cross-fuel and gas-gas competition. A question remains how the basic financial, demand and price risks in the supply chain can be addressed more appropriate. This leads to the modern concept of financial risk management concerning commodity markets whose different instruments should be applied combined.

6.1 Short-term Contracts

Firstly, short-term gas sales agreements among producers and consumers, producers and shippers with durations up to 3 years and flexible spot market based pricing will be a valuable tool.

6.2 Spot Markets

Liberalising and granting third party access meet the key-criterion of spot market development: a large number of liquid buyers and sellers in order to create sufficient market volume[110]. The other criteria are deregulated prices, transparency by

[108] H. Avati, *Prospects still look rosy*, Petroleum Economist 14 (March 1999) p14; V. Thomas, *Suppliers queue up for Europe*, Petroleum Economist 11 (March 1999) p11; F. Thackerey, *EU seeks supply security for its Nordic Members*, Petroleum Economist 4 (March 1999) p 4: The Nordic Grid will increase the number of consumers significantly.
[109] J. Gillam, *Opportunities in an Open European Gas Market*, O.G.L.T.R. 445 (1996) p 446.
[110] M. Powell, Deregulation of European power and gas markets, Petroleum Economist 31 (October 1999) p 32.

published bids so that a market occurs for gas contracts concerning physical deliveries of one week or a few months in advance[111]. These markets will evolve from unregulated OTC trades[112] via semi-regulated NBP-trades[113] to stock exchanges including standard contracts and involving financial intermediaries which reduces party risks and negotiations[114].

6.3 Markets for Derivatives

On the basis of an established gas spot market markets for derivatives will evolve[115]. This establishes the trading of OTC-Forward contracts[116], of futures[117], options[118] and swaps[119] which are usually settled by cash. By carefully hedging and position-taking, the marketers can reduce financial, demand and price risks similar to long-term TOP obligations without causing incompetitive, inflexible and distorted gas markets.

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[111] As it involves deliveries of one week in advance, it may be defined as a short term forward market.
[112] Over-The-Counter trades, e.g. the U.K. beach trades occurring in 1993 , q.v. E. Pethybridge, *Understanding the Legal and Regulatory Issues of U.K. Spot and Future Gas trading*, O.G.L.T.R. 375 (1997) p 375, 376, 378.
[113] National Balancing Point OTC trading. These trades are affected by Network Code which was negotiated by traders and Transco concerning third party access. NBP trading eliminates certain risks of beach trades, q.v. E. Pethybridge, *Understanding the Legal and Regulatory Issues of U.K. Spot and Future Gas trading*, O.G.L.T.R. 375 (1997) p 376-377, q.v. C.Robson, The Network Code: Confirmation of Fundamental Change to the Gas Supply Industry in Great Britain, O.G.L.T.R. 509 (1996). A standard short-term flat NBP contract was developed in November 1997, q.v. M. Polonsky, *Short-Term Flat NBP Trading Terms and Conditions*, O.G.L.T.R. 163 (1998) p 163.
[114] International Petroleum Exchange trading, launched in January 1997.
[115] A.S. De Vany and W.D. Walls, The Emerging New Order in Natural Gas 84 (1st ed. 1995).
[116] A forward denotes a derivative OTC contract which is carried out in the future based on a fixed price, q.v. M. Madden, *Trading and Risk Management Tools for Converging Gas and Electricity Industries*, O.G.L.T.R. 411 (1998) p 414.
[117] A future contract similar to a forward but traded in a regulated exchange.
[118] Option contracts deal with rights of one party to oblige the counter-party to sell (call) or to buy (put) a good.
[119] Commodity swaps deal with the future sale of good based on pricing formula including exchange rates, spot prices, competing fuel prices and other indices; q.v. P. Aston and D. St. Claire Nelson, *Commodity Swaps-A guide*, O.G.L.T.R. 117 (1991) p 117.

7. Annexes

7.1 Traditional Structure of the U.S. Gas Industry

[Image, omitted in the online version, please contact the author]

Source:

R.J. Sutherland, *Natural gas contracts in an emerging competitive market*, Energy Policy 1191 (1993) p1193.

7.2 Present Structure of the U.S. Gas Industry

[Image, omitted in the online version, please contact the author]

Source:

R.J. Sutherland, *Natural gas contracts in an emerging competitive market*, Energy Policy 1191 (1993) p 1193.

7.3 Third Party Access in Europe

[Image, omitted in the online version, please contact the author]

Source:

Percebois, J., *The gas deregulations process in Europe: economic and political approach*, 27 Energy Policy 9 (1999) p 15.

7.4 Text of the IGMD

[Omitted in the online version, please contact the author]

Source:
Directive 98/30/EC of the European Parliament and of the Council of 22 June 1998 concerning common rules for the internal market in natural gas
Official Journal L 204 , 21/07/1998 p. 0001 - 0012
http://europa.eu.int/eur-lex/en/lif/dat/1998/en_398L0030.html